Managing Marine Debris in Olympic Coast National Marine Sanctuary

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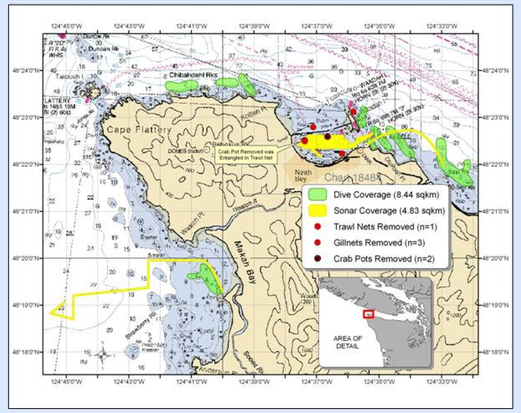
Introduction

Resource protection goals of the Olympic Coast National Marine Sanctuary (OCNMS) Management Plan include reducing threats to sanctuary resources and coordinating activities between management and regulatory agencies. In 2005, the Sanctuary initiated a pilot program to achieve these goals by addressing environmental threats posed by derelict fishing gear (DFG). The extent of threats posed by DFG in OCNMS is unknown. Surveys were conducted to locate derelict gear. OCNMS partnered with the Makah tribe, Natural Resources Consultants (NRC) and local commercial harvest divers to remove the gear.

A derelict net is removed from Neah Bay by crew aboard biodiesel-fueled vessel *BetSea* in Oct. 2005.

Benefits of derelict gear removal

- Improves fish habitat & restores potential fishing areas
- Decreases unwanted species mortality
- Decreases risk of gear entanglement & economic losses for fishermen
- Improves recreational diver safety
- Reporting system facilitates community involvement



Pilot project surveys were conducted *in situ* by scuba divers and with ship-based side-scan sonar. Survey locations and recovered derelict gear sites are shown in the map above.

The Sanctuary

Designated in 1994, OCNMS consists of approximately 8577 sq km of coastal and ocean waters, and associated submerged lands off the northwest coast of the State of Washington. Certain activities are prohibited within the Sanctuary, such as development of oil and gas resources. Other activities, such as fishing, are permitted.

Derelict fishing gear: A threat to protected resources

- Derelict fishing gear is nets, lines, crab & shrimp pots and other recreational or commercial fishing equipment that has been lost, abandoned or discarded in the marine environment.
- DFG can persist in the environment for decades, posing a threat to marine mammals, seabirds, fish and invertebrates by trapping and killing organisms through "ghost fishing" and damaging critical marine habitat.

Table 1. Animals found in four recovered derelict nets.

Name	# Alive	# Dead	Total	% mortality
Marine mammals				**100**
California sea lion, *Zalophus californianus*	0	1	1	
Harbor porpoise, *Phocoena phocoena*	0	1	1	
Harbor seal, *Phoca vitulina*	0	6	6	
Sea Birds				**100**
Cormorant, *Phalacrocoracidae spp.*	0	3	3	
Common loon, *Gavia immer*	0	5	5	
Fish				**89**
Cabezon, *Scorpaenichthys marmoratus*	1	8	9	
Invertebrates				**41**
Kelp crab, *Pugettia producta*	15	3	18	
Red rock crab, *Cancer productus*	1	8	9	
Overall total	**17**	**35**	**52**	

Table 2. Animals found in two recovered crab pots.

Common Name	Scientific Name	# Alive	# Dead	Total	% mortality
Invertebrates					**75**
Red rock crab*	*Cancer productus*	1	0	1	
Dungeness crab	*Cancer magister*	0	3	3	
	Overall total	**1**	**3**	**4**	

* Red rock crabs are likely opportunistic foragers on carcasses in nets, which might explain their low observed mortality.

Pilot Project Summary

- 5 days of diver surveys completed covering 8.44 km^2
- 5 days of side-scan sonar surveys and 1 day of post-survey processing completed covering 4.83 km^2
- 7 derelict gear removal days conducted (5 dive days and 2 transit and offload days)
- 3 gillnets removed covering 0.75 seabed acres of critical high relief rocky habitat
- 1 trawl net removed covering 0.02 seabed acres
- 2 crab pots removed
- 52 organisms removed; mortality rates are high, esp. among birds, mammals, and fish
- Residence time of nets and pots as DFG unknown
- High "turnover" rate of animals trapped in DFG is likely—identified organisms only indicate recent mortality
- Cumulative # of organisms killed by DFG is unknown and likely underestimated by count at time of removal

A cormorant (left) and remnants of a fish carcass, crab carapace and mollusc (right) were among the organisms found in nets removed during the pilot project.

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